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ABSTRACT

An attitudinal survey that contrasted student perceptions on environmental/energy questions during the decade of intense concern for these issues was conducted at Cornell University in 1971 and 1981 (3,414 and 3,867 students were sampled, respectively). The survey was designed to measure changes in attitude toward 35 specific items in five major categories (food-stuffs, household items, transportation, personal items, and recreation). Significant differences were observed between the two surveys with most of the differences associated with political leanings, income, sex, and geographic background. The changes were in the direction of a more materialistic life style with less consideration for environmental/energy issues and concerns. (The questionnaire used in the survey is included in an appendix). (Author/JN)

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ENVIRONMENTAL ATTITUDE SURVEY OF UNIVERSITY STUDENTS

1971 vs 1981*

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ABSTRACT

An attitudinal survey that contrasted student perceptions on environmental/energy questions during the decade of intense concern for these issues was conducted at Cornell University in 1971 and 1981 (3414 and 3867 students sampled, respectively). The survey was designed to measure changes in attitude toward 35 specific items in five major categories (Food-stuffs, Household Items, Transportation, Personal Items and Recreation). Significant differences were observed between the two surveys with most of the differences associated with political leanings, income, gender and geographic background. The changes were in the direction of a more materialistic lifestyle with less consideration for environmental/energy issues and concerns.

INTRODUCTION

Numerous factors played upon the public conscience during the '60s to make the public acutely aware of environmental and resource issues. The intensity of this awareness was reflected in the terminology of the time when words such as "crisis", "extinction", "ecotastrophe", "contamination", and "population" became the vernacular.

Academia responded well to these newly recognized problems, and campuses experienced a rejuvenation of fields such as natural resources, ecology, toxicology, and environmental quality. At Cornell University, Professors Bruce Wallace and Stanley Zahler made a singular contribution by originating a course entitled "Biology and Society", an evening course designed to attract students from all of Cornell's colleges and the community at large to a forum where experts addressed these problems. Vigorous discussion followed each formal presentation which regularly attracted audiences of 700 to 1,000 students and townspeople. The significance of the course was nationally recognized in February 1971 when Professor Wallace was awarded a Presidential Citation for its origination.

To allow fuller participation, discussion sessions of 10 to 30 students led by volunteer faculty members were organized and used as a setting for a large variety of study and action projects. In a section led by E. L. Gasteiger, a group of twenty-two students concluded that the socio-economic aspects of the impact of population on environment were, indeed, real and that personal sacrifices undoubtedly would have to be made. They formulated the question, "What am I willing to give up?" This evolved into an attitudinal questionnaire (Appendix A) that the class used as a sensitivity raising device and as a means of obtaining a picture of the actual "mind-set"

of Cornell students on these issues. Very early it became evident that the questionnaire touched a chord of curiosity in those who read it, for the idea of "sacrificing" served as a challenge to the individual and raised the hope that it would foster an altruistic attitude in others.

With this encouragement, a sampling design was developed and the questionnaire was used to survey Cornell students in April, 1971. Ten years later the Cornell student body was again polled to determine any changes in attitudes and possible reaction to events that had ensued during this period. The resulting studies focused on the student's self-rating of his or her willingness to give up items in major categories that have an impact on life style, use of resources and contamination of the environment.

For both the 1971 and 1981 surveys the interest was very high as judged by response level and the numerous comments on the returned questionnaires. Thus, the sensitivity raising aspect of the questionnaire was judged to be successful. The large number of responses provided statistical profiles of the students polled, an indication of how they view themselves in relation to environmental problems, and how the attitudinal perceptions differed for the two groups separated by the span of a decade.

BACKGROUND

Although Earth Day of 1970 is considered by many to be the major starting point of the Environmental Era, there were efforts directed toward public opinion surveys on environmental issues during the 1960's (1,2,3). Most of these early efforts concentrated on air quality and were usually site specific or directed toward certain populations (4). As the environmental issue emerged into a full-fledged social problem, more surveys and indices

were developed to examine public opinions about the nature, extent and control of environmental pollutants. The quality of life became a central theme and widespread investigations were initiated to examine air, water, and soil resources and their interrelationships to life in an ecological and sociological world.

Many of the surveys were attempts to measure the general attitudinal status of various populations and therefore utilized a simple questioning format (i.e., answers that were "yes, no, agree, definitely agree, very serious problem, serious problem, small problem, no problem, etc.") (5,6,7,8). In these cases the respondent usually checked the appropriate category and the results were tabulated and reported.

Other efforts were expanded to world-wide or global views and include environmental considerations as a part of industrial or productivity surveys (9). In these contexts, environmental controls were often seen as major deterrants to economic growth and improved productivity.

DESIGN OF STUDY

The questionnaire was designed within the student discussion group. The format and content were selected to encourage participation and provide a broad examination of energy and resource issues as they relate to daily life. Every item or question considered for the survey was reviewed and revised in the group environment. The questionnaire was then pre-tested in several classrooms to determine the applicability and effectiveness of the design. In it's final form, the questionnaire consisted of four sections that, for practical reasons, would fit on one sheet. In the first section there was requested a reaction on a scale of 1 (strongly agree) to 5 (strongly

disagree) to the statement: "In the U.S. our material and energy resources are seriously limited when considered in terms of population growth, increasing per capita consumption and increased environmental pollution." The reaction to this statement served as a setting for the second section of the questionnaire.

In the second section, the extremes of the rating scale were also identified with descriptive words in addition to the numerical values (least willing as a 1 and most willing as a 5). This procedure was designed to provide broad responses on a numerical basis and thus minimize biases arising from over-use of descriptors. The focus of this part of the survey was to have students rate themselves about their "willingness to give up" specific items in five major groupings (seven items per group for a total of 35 items). The groups were identified as Food-stuffs, Household Items, Transportation, Personal Items, and Recreation. Specific items were intentionally chosen to be diverse and thus elicit a wide range of responses.

The third section was designed to assess the means or methods that respondents would prefer "if it became necessary to limit our energy and material consumption". The basic choices ranged from voluntary restraints to governmental control.

The fourth section of the questionnaire contained questions which identified the respondent in terms of academic status, college or school of study, gender, marital status, age, family size, background, home state, family income, purchasing power, and political leanings.

RESPONSE RATES AND RETURN PATTERNS

Response Rates and General Population Characteristics

In 1971, a one-third proportionate sample of students enrolled in each of the undergraduate colleges at Cornell University was selected from the registrar's alphabetized listing. Questionnaires were mailed to 3,414 undergraduates, and 1,895 completed surveys were returned. The response rates ranged from 32.4 percent to 62.0 percent among the various colleges and averaged 55.5 percent for the entire sample.

In 1981, a similar sampling pattern was followed, and 3,867 students were surveyed from whom 1,363 replies were received for an overall 35.2 percent response rate. Despite the lower overall response rate there were no significant differences in the distribution pattern of responses among the four undergraduate classes of 1971 and 1981 nor in the rate of returns of the questionnaires. However, in 1971, 32.7 percent of the respondents were female whereas by 1981 this representation had increased to 43.4 percent. The change was in agreement with the increased number of female students in attendance in 1981. The sampling responses for both years corresponded to the known regional distribution patterns for Cornell students, with 55 percent indicating New York residency and 63 percent declaring suburban backgrounds.

Pattern of Responses

In both samplings the magnitude and timeliness of responses was indicative of the interest and support of the survey. By the fourth day after mailing 83.2 percent in 1971 and 74.2 percent in 1981 of the replies were received. The returns were essentially complete within a two week period and no follow-ups were conducted.

ANALYSIS

Inter-survey comparisons were tested with paired "t" tests to examine the differences in attitudes toward specific items over the ten year span. Results for these analyses indicated that significant differences at the 0.05 level were observed for 25 of the 35 items tested. Thus, definite shifts in attitudinal response were observed for this period.

Inter-Survey Data Comparisons

The initial question presented on the survey questionnaire was concerned with students' reaction to the statement about our material and energy resources. Although the mean numerical values were quite similar for the 1971 and 1981 survey (4.14 versus 4.00), those who checked the category "strongly agree" were significantly fewer in 1981 than in 1971 (37.3% versus 45.7%, Figure 1). This shift was consistent with the patterns that developed for many other 1981 responses. This was especially true in terms of the political leanings that were designated by the students (Figure 2). In 1981 the average political rating by the students was 3.87 versus 3.28 for the 1971 respondents (on a scale where 1 = very radical and 7 = very conservative). This was a significant to shift conservatism (0.01 level) over the ten-year span and is an important component of the attitudinal responses for many of the items in the survey. Another important shift was shown by the proportion of students who changed their outlook about the desired purchasing power of their family versus their parents' family. In 1971, 58.4% of the students indicated that they desired their own families to have equal or greater income than their parents' families whereas by 1981 the proportion who had such feelings had increased to 73.7%.

FIGURE 1

**Reaction to Limited Resources Question
Environmental Attitude Survey 1971 vs 1981**

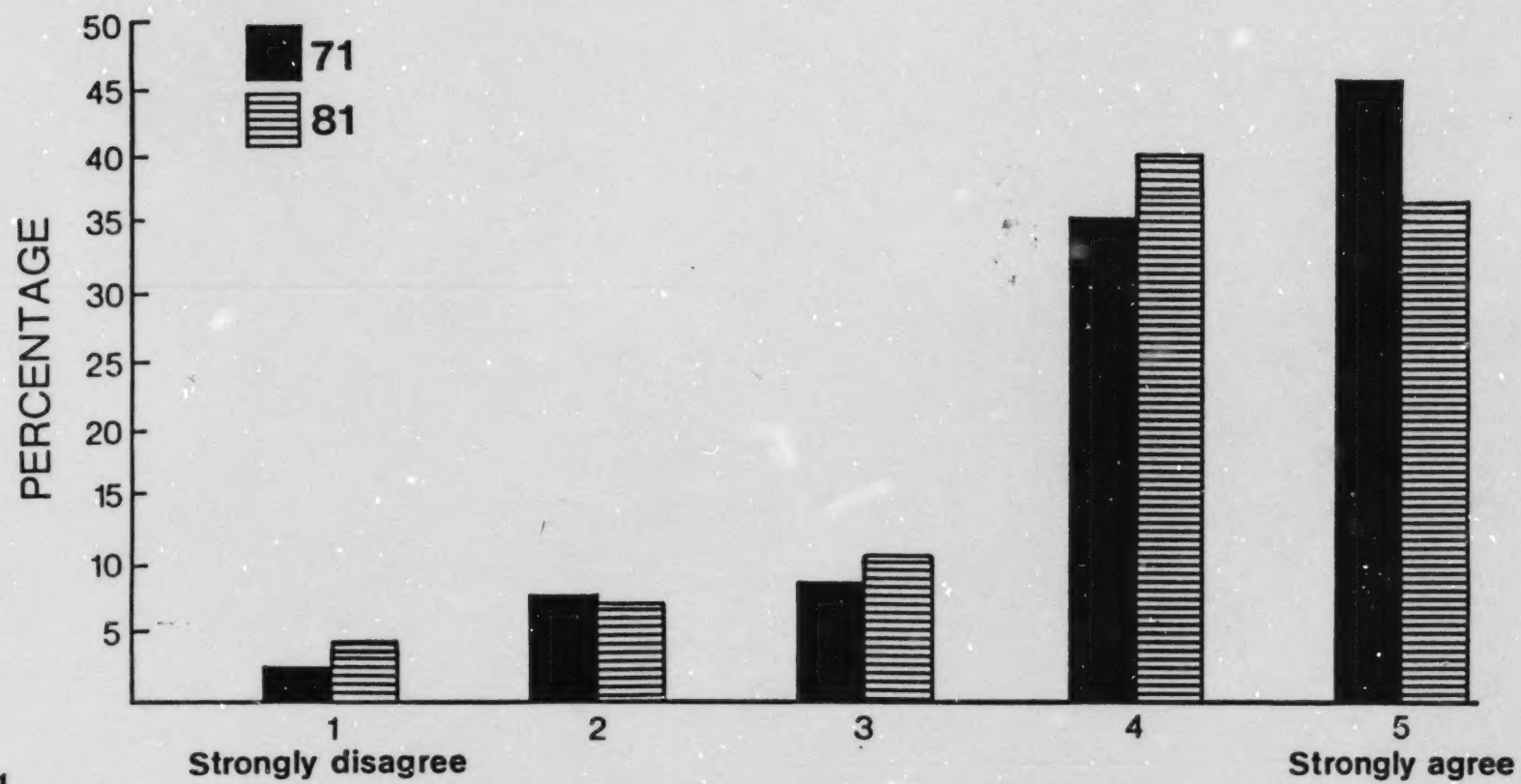
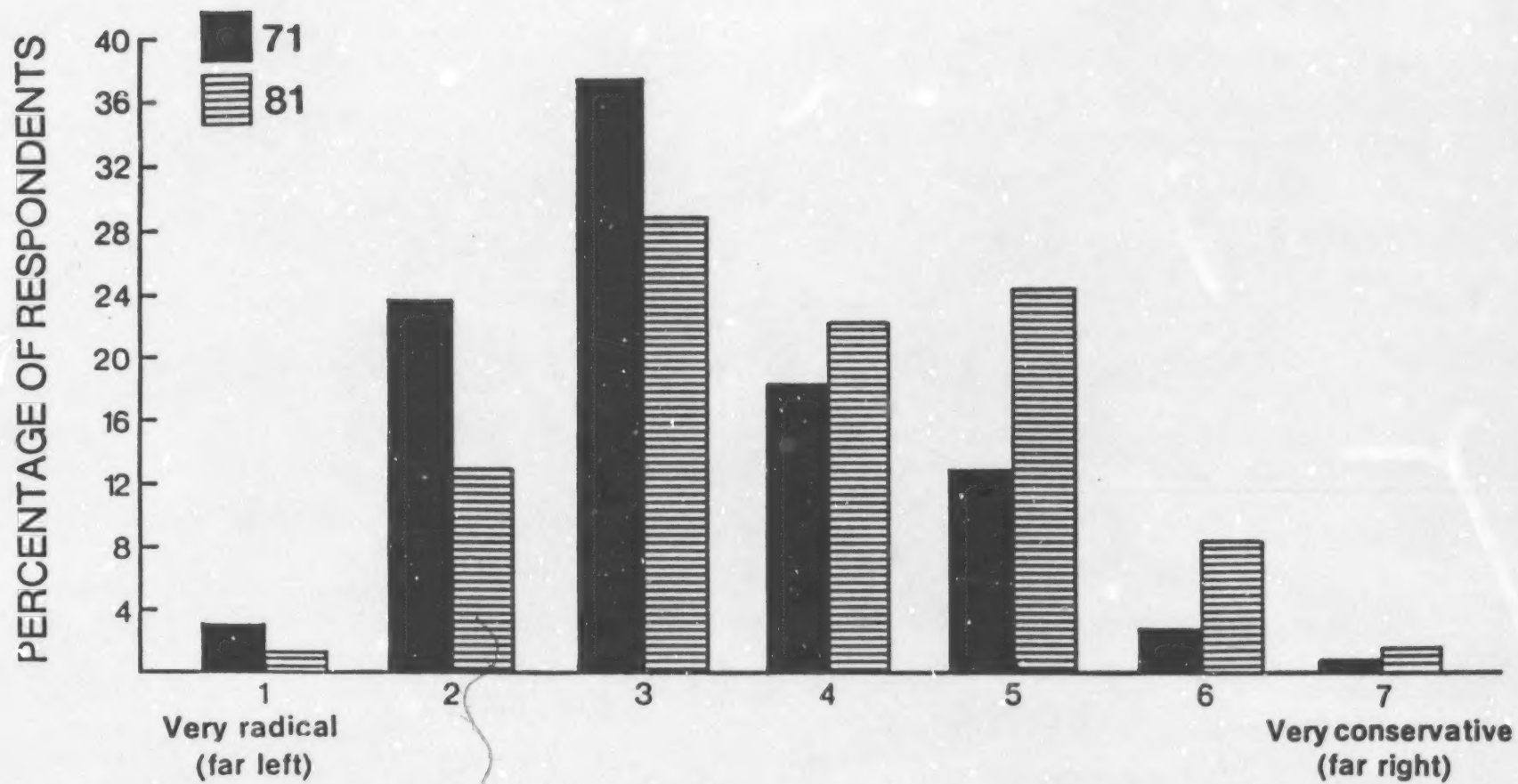


FIGURE 2

**Political Leanings of University Students Completing
Environmental Attitude Survey 1971 vs 1981**



Comparative attitudinal responses for each of the major groupings for the 1971 and 1981 surveys were determined (Figs. 3-7). Most of the changes indicated that the 1981 respondents were "less willing to give up" various items than were the 1971 respondents. The 1981 data had 21 of 35 items with lower numerical values than the 1971 data (six items showed no change). A discussion of the changes within each major category follows:

Food-stuffs (Figure 3) - Significant differences were observed for four of the seven items in this category. Three of these changes showed 1981 students as more willing to give up frozen foods, beefsteak and milk than the 1971 students. However, the change for milk did not affect its "least willing to be given up" standing among all food-stuff items for both surveys. In contrast, it was evident that canned soft drinks were the "most expendable" item in this group even though the 1981 respondents were less willing to give them up.

Household Items (Figure 4) - There were five items (clothes dryer, telephone, hi-fi, home freezer, and home garbage disposal) that showed significant differences in this category. The general tendency for the 1981 data was toward less willingness to give up items in this group. In both surveys there was a willingness to give up the home garbage disposal and air conditioner.

Transportation (Figure 5) - This category had the most items that were viewed differently over the study period. Six of the seven items were significantly different at the 0.01 level and every item in this group had a lower numerical value for 1981 than for 1971. Thus, 1981 respondents found

FIGURE 3

Food-stuffs

For Figures 3 through 7 (*) signifies a significant difference at the 0.05 level between the 1971 and 1981 surveys while (**) signifies a difference at the 0.01 level.

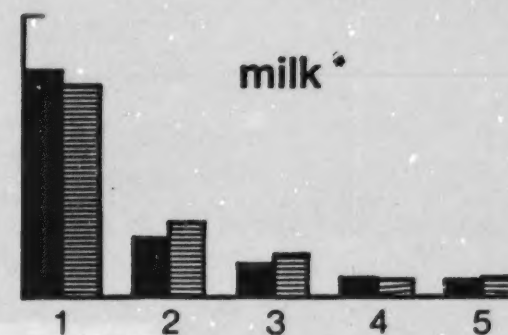
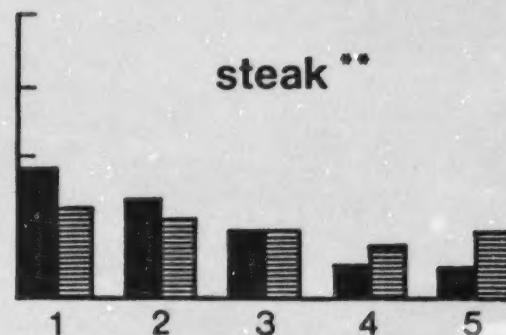
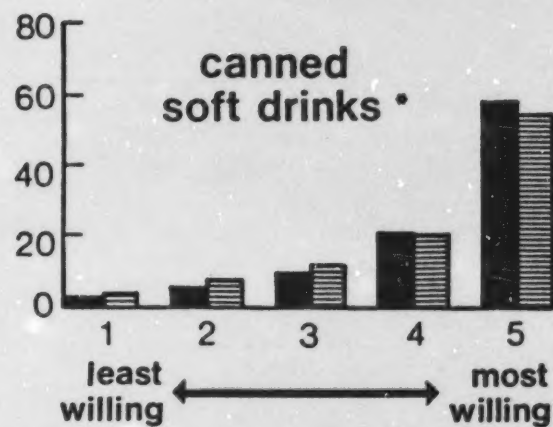
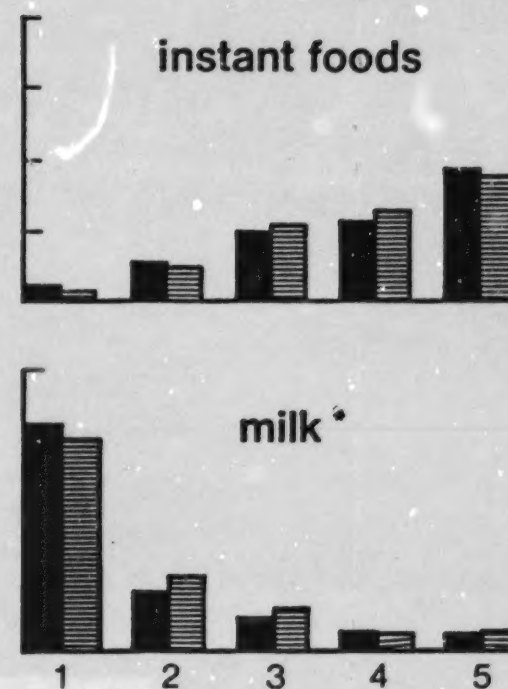
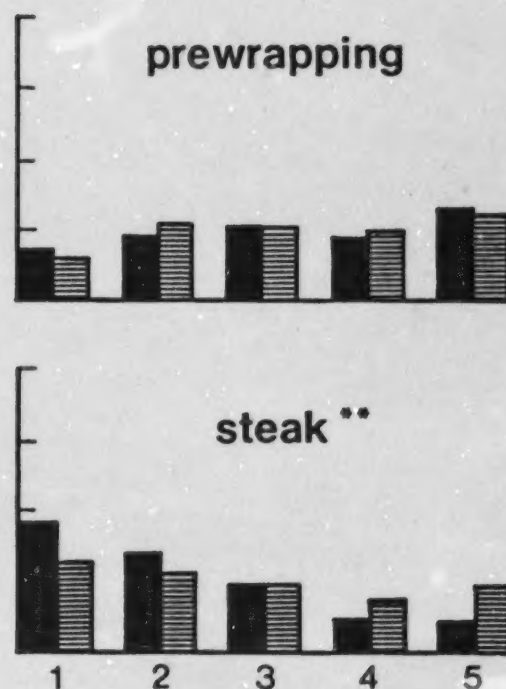
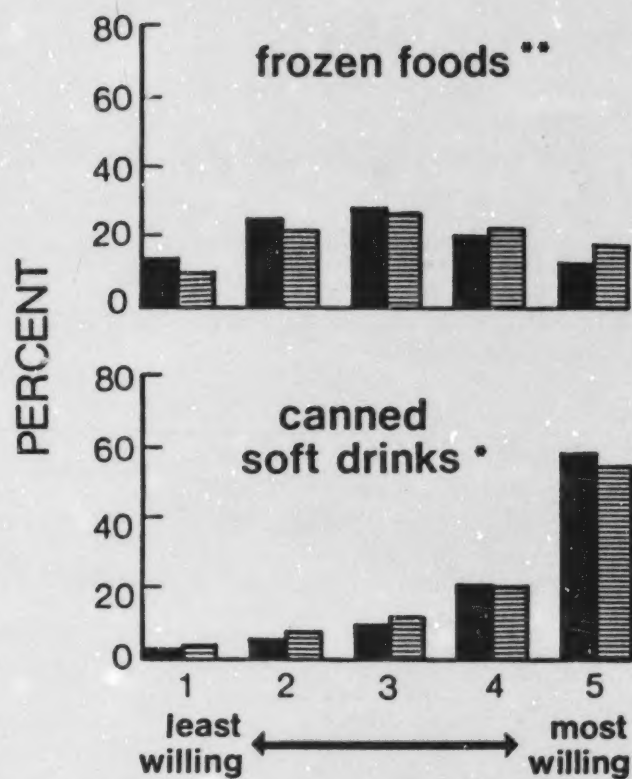
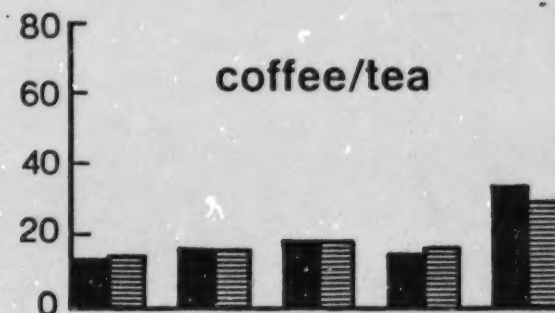


FIGURE 4
Household Items

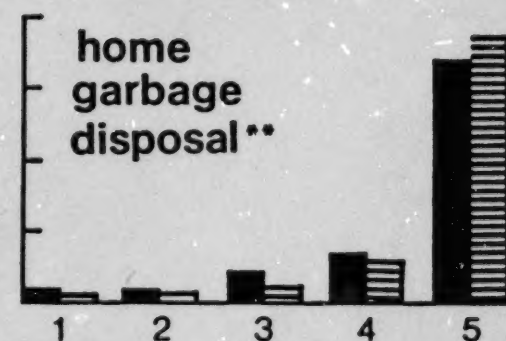
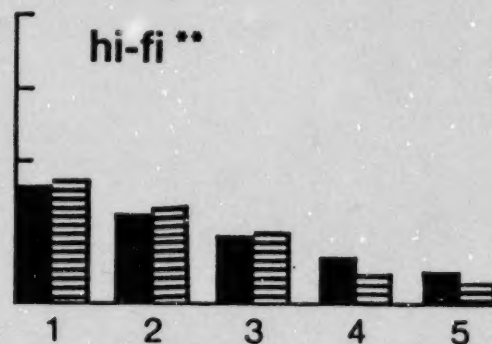
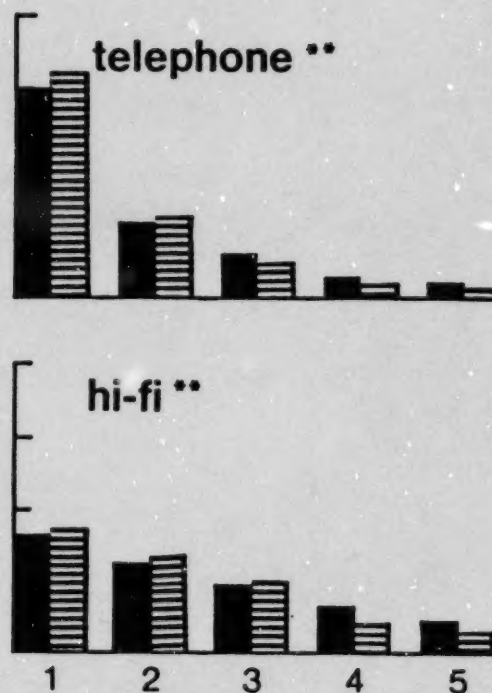
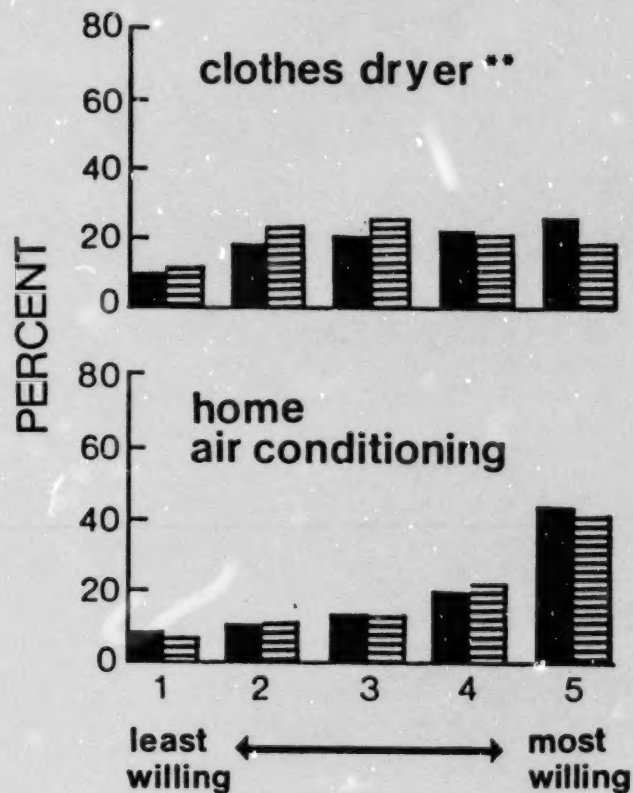
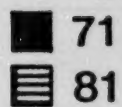
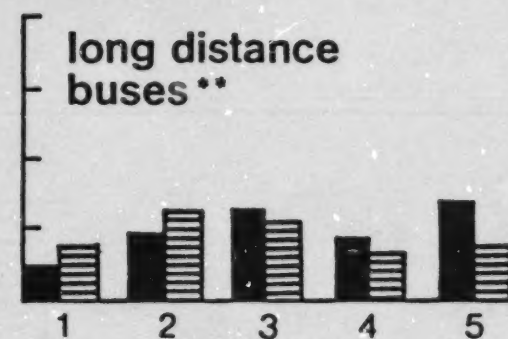
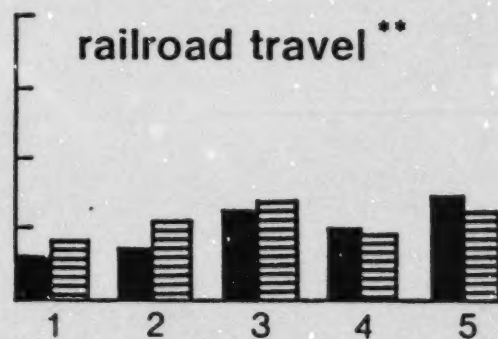
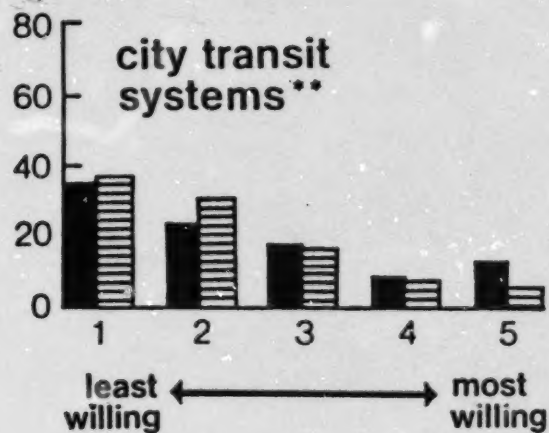
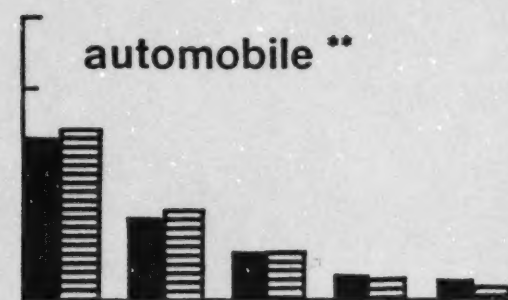
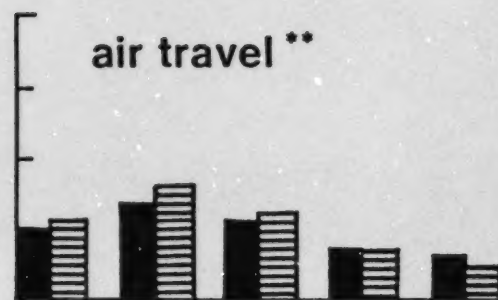
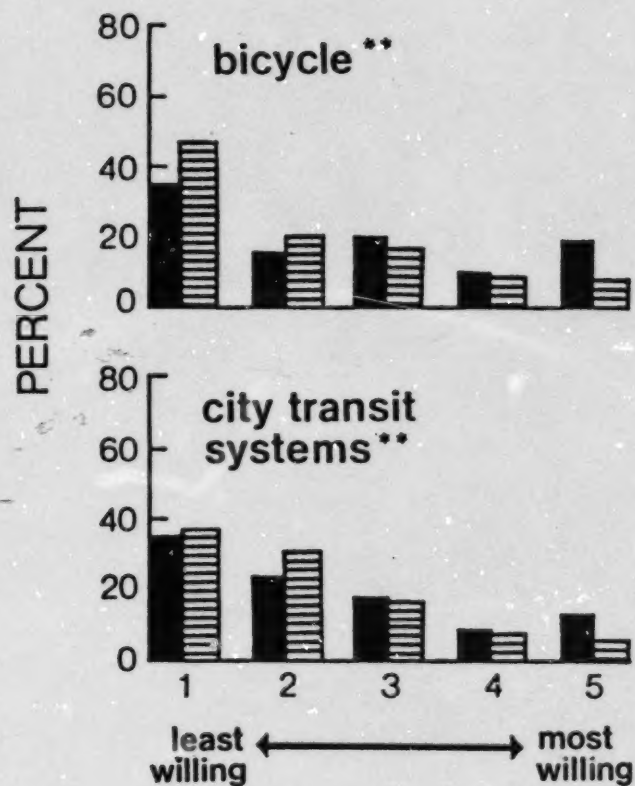


FIGURE 5
Transportation



it more difficult to relinquish transportation items. However, supersonic jet travel was the clear choice as the most expendable item in both surveys.

Personal Items (Figure 6) - This was another grouping where there were significant differences for 5 items; the changes were all toward lower numerical values. Thus, the 1981 respondents were less willing to give up personal items than were the 1971 respondents, and soap was clearly the item that was considered most essential by both groups.

Recreational (Figure 7) - Although there were five (5) items that were significantly different over this time span, the direction of the changes were not consistent. The 1981 respondents were more willing to give up hiking and the motorcycle, whereas in 1971 the respondents preferred giving up skiing, country club, and live music.

Intra-Survey Data Comparisons

Analysis of variance techniques were used for the data within each survey period. Variables such as political leaning, income, academic factors (class, college or special courses), gender and geographic background (rural, urban, suburban, home state) were tested against the set of attitudes in each grouping to examine the importance of these variables in the attitudinal choice patterns.

Political

For purposes of analyses numerical responses 1 and 2 were combined to form a left of center or liberal group, numerical responses 3, 4, and 5 were combined to form a center or mid-group and numerical responses 6 and 7 were

FIGURE 6
Personal Items

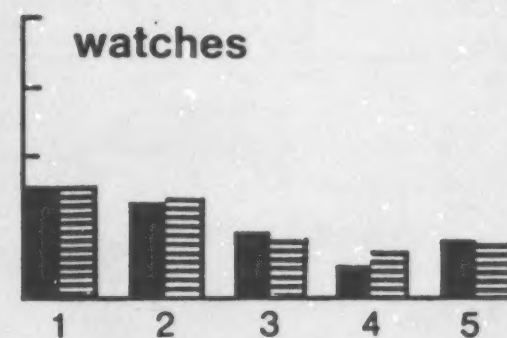
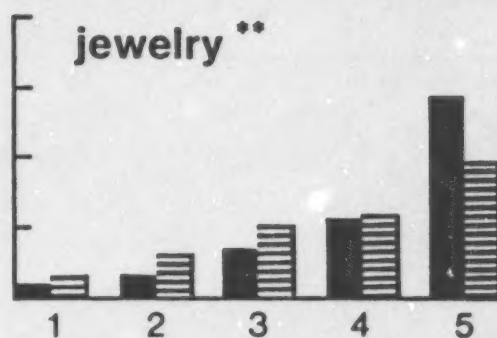
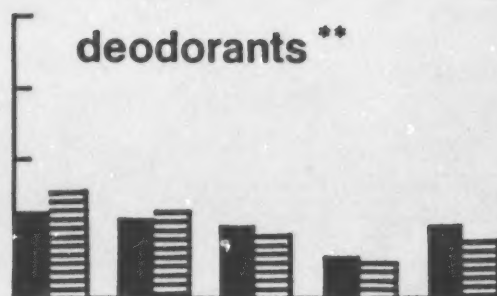
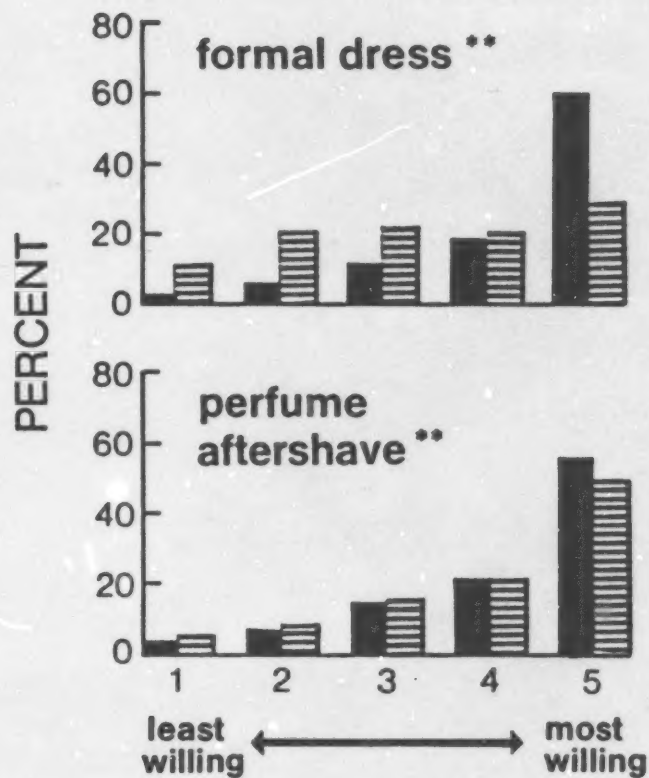
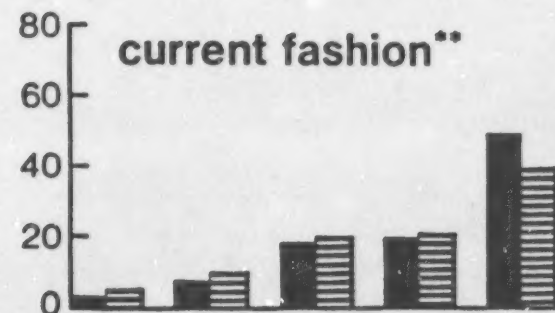
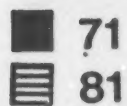
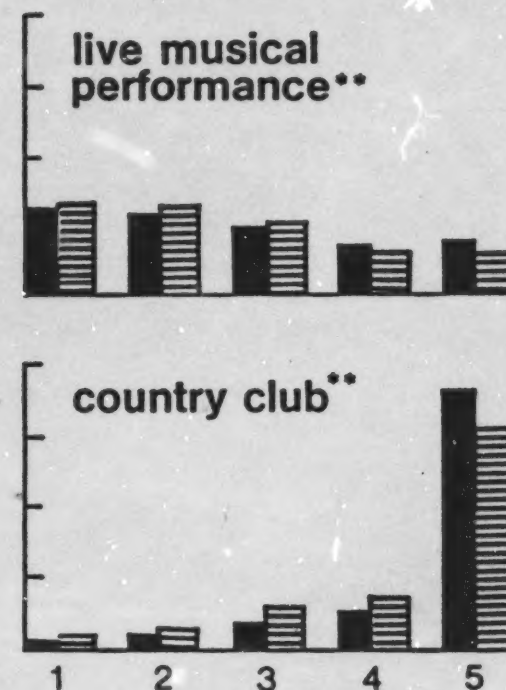
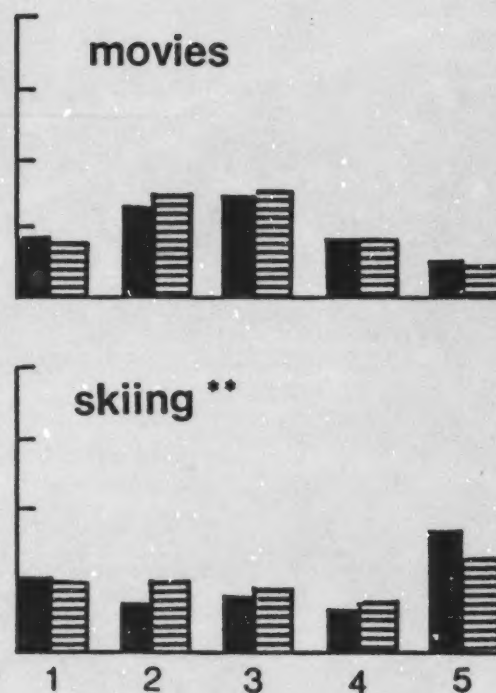
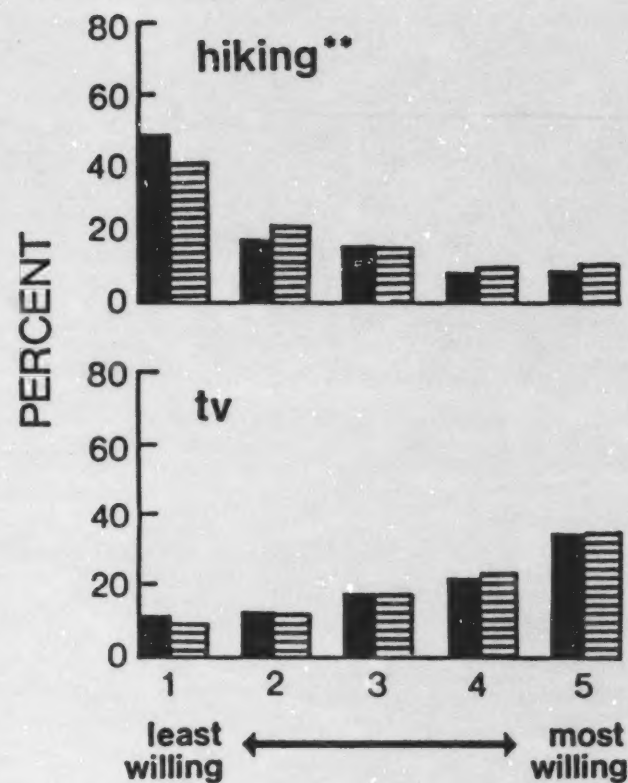
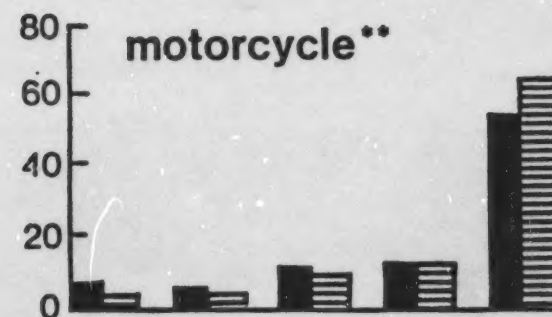
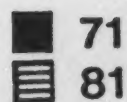


FIGURE 7
Recreation



combined into a right of center or conservative group. These groupings gave consistent stepwise response patterns in both surveys and clearly indicated a significant shift (.01 level) to conservatism (Figure 2). The liberal group declined from 26.7 to 14.3 percent, whereas the middle group increased from 69.1 to 75.6 percent and the conservative group rose from 3.7 to 10.0 percent.

When the attitudinal responses for various items in the survey were tested against the political leanings, the results indicated significant differences at the .05 level (33 of 35 items in 1971 and 28 of 35 items in 1981) . Thus, the political tendencies of students in both surveys had a strong bearing on their selections in the survey questionnaire. By 1981, attitudes had shifted and there was a greater reluctance to give up items. Those students considering themselves as more liberal were most willing to give up items but did so in a selective manner. However, they tended to be less willing than conservatives to give up some very specific items such as coffee and tea, hi-fi, bicycle, city transit, rail travel, long distance buses, hiking, movies and live musical performances. The differences were widest in the personal item category where the liberals gave a clear message that such items were expendable.

Income

The percentage distribution of respondents from various income levels shows an obvious shift to higher levels with only 10.2 percent of the families having incomes over \$35,000 in 1971, whereas 46.3 percent of the families had incomes over \$35,000 in the 1981 survey (Table 1). However, when this shift is compared to the changes in the Consumer Price Index (from 121 to 270 during this period) it seems that the income of student families

TABLE 1
FAMILY INCOME LEVELS OF UNIVERSITY STUDENTS COMPLETING
ENVIRONMENTAL ATTITUDE SURVEY, 1971 vs 1981

<u>Income Level</u>	<u>1971</u> (percentage of respondents)	<u>1981</u>
\$1-5,000	5.5	1.7
\$5,000-9,000	14.2	3.9
\$9,000-16,000	30.1	8.5
\$16,000-24,000	25.0	16.5
\$24,000-35,000	15.0	23.1
\$35,000-50,000	5.6	20.9
\$50,000-65,000	4.6*	10.5
\$65,000 and over	---	14.9

* 1971 Survey 50,000 and over

did not keep pace with inflation.

When income levels were tested against the willingness to give up various items, there were 16 items in each year that showed significant correlation of income with the decision-making process. Ten of these items were common to both surveys and they included: clothes dryer, home air conditioner, telephone, hi-fi, air travel, supersonic jet, long distance buses, current fashion and skiing. Household and transportation were the two groups with the most items for which the responses were associated with income.

In general, the response patterns were correlated with income levels (i.e. high income groups were much less willing to give up items than were middle and low income groups). For purposes of comparison the family income data from both surveys were combined into three groups that were representative of the students attending Cornell.

Low Income - up to \$9,000

Middle Income - \$9,000 to \$35,000

High Income - \$35,000 and over

Although considerable changes occurred in family income levels during this span of time, these groupings were retained for both surveys to provide an approximation of income related effects. In both surveys, respondents from the high income group had lower mean attitudinal values than the middle and low income group (25 of 35 items lower in 1981 and 23 of 35 lower in 1971). Thus, they revealed their greater reluctance to sacrifice.

Responses and trends in each major category as determined by changes in mean attitudinal values were as follows:

Food-stuffs: Two items in this group were easy choices for

respondents from all income groups: milk, as the "least willing give-up" and canned soft drinks, as the "most willing give-up". Otherwise, high income respondents were least willing to give up 4 of 7 items in 1981 and only 2 of 7 items in 1971.

Household Items: In both surveys the high income respondents were more reluctant to give up every item in this group than were the respondents from other income groups. The home oven and telephone were considered the least expendable items, whereas the home garbage disposal and air conditioner were the most expendable items for all income groups.

Transportation: The automobile and city transit systems were important items to retain for respondents from all income groups and the supersonic jet was easily the most popular give-up. High income respondents were least willing to give up 3 of the 7 items in 1981 as contrasted to 5 of 7 items in 1971 (city transit, air travel and the automobile were less willing give-ups in both surveys). Low income respondents were most specific about retaining long distance buses in both surveys.

Personal Items: Perfume/aftershave, jewelry, current fashion and formal dress were ranked as the most expendable items in this group while soap was considered the most essential item by respondents from all income groups. High income families were less willing to give up 6 of the 7 items in each survey (deodorants were the only exception with low and middle income respondents reporting slightly less willingness to give up this item).

Recreation: Hiking was clearly the most important recreation item

for retention among all income groups. As expected, high income respondents were less willing to give up recreation items than were middle and low income respondents. The country club and motorcycle were the preferred give-up items for families from all income levels. Television was the third ranked give-up item by respondents, irrespective of their income.

Some of the income associated responses may be correlated to the financial expectations included in the question as to whether the respondents "wanted the purchasing power of their family to be greater than, less than, equal to, or no opinion, when compared to your parents' family". In 1971 34.8 percent checked the "greater than" level of purchasing power whereas by 1981 this choice had risen to 45.5 percent of the respondents. Those students checking the desire for "less" purchasing power than their parents' family declined from 8.5 percent in 1971 to 4.5 percent in 1981. The category for family purchasing power to be "equal to" their parents' rose from 23.6 percent in 1971 to 28.2 percent in 1981. Much of the shift appeared to come from the "no opinion" category (33.1 percent in 1971 versus 21.8 percent in 1981). Thus, by 1981 the general trend was toward a financial preference that was "equal to" or "greater than" the purchasing power of the respondents families. This is consistent with the income-related responses shown for the major groupings in the study.

Academic Status

Class: Very few attitudinal differences were observed in either survey which were related to the year of study by students (Freshmen, Sophomore, Junior or Senior). In general, the overall trend in both surveys was for the first two classes to be less willing to give up items than the

two upper classes. There were only six items in the 1971 survey and three items in the 1981 survey in which academic class was considered as a significant factor in the choice patterns. In 1971 the first two classes were less willing to give up prewrapped foods, milk and the clothes dryer, whereas they were more willing to give up coffee/tea, home oven and rail travel than were the two upper classes. In 1981 the first two classes were more willing to give up the home air conditioner and less willing to give up city transit and television than were the two upper classes. Thus, overall, academic class differences were minimal.

College or School: In direct contrast to the minimal effects of academic class, the influence of college or school of enrollment was very important with 28 items of 35 being significantly correlated in 1971 and 23 of 35 significantly correlated in 1981. The differences followed a rather traditional pattern wherein students from the arts and sciences areas were definitely more liberal and willing to give up items than were engineering, agriculture, and human ecology students. In 1971 the items that appeared to be more basic and least influenced by college or school of enrollment were frozen foods, prewrapping, telephone, home oven, home freezer, long distance buses, and soap. In 1981 the items least influenced were canned soft drinks, instant foods, milk, clothes dryer, telephone, home oven, home freezer, railroad travel, automobile, soap, watches, and live musical performances. All other items indicated significant differences associated with the college or school of enrollment.

Special Courses: Attitudinal responses from students taking special biology and society courses were compared with those not taking such

courses. In 1971 only nine items were significantly correlated with taking such courses whereas there were twelve items in 1981 (1971: prewrapped foods, clothes dryer, air travel, supersonic jet, formal dress, jewelry, current fashions, live musical performance, country club; 1981: canned soft drinks, prewrapped foods, beefsteak, bicycle, air travel, automobile, deodorants, current fashions, soap, watches, hiking, skiing). For the two surveys students enrolled in the courses tended to be more willing to give up these items, with the exception, in 1981, of the bicycle, hiking and skiing which they preferred to keep. The reluctance to give up these three items is consistent with the need for lower energy use and lower polluting activities.

Gender: Sixteen items in 1971 and 18 items in 1981 showed significant differences (0.05 level) when gender was used as an independent variable. The differences were found primarily in food-stuffs, personal items, and recreation (Table 2). The importance of personal items to females is evident. However, there were a large number of items for which the response patterns were similar for both sexes, especially in the household, transportation and recreational categories.

Geographic Background

It was clear in both surveys that respondents from rural areas were most willing to give up items whereas urban respondents were least willing and suburban respondents were in the middle of the scale. Significant differences in the rural-urban-suburban classification were observed for 16 items in 1981 and 12 in 1971. Most of the differences were found in the transportation and recreational categories. In a regional context (New York,

TABLE 2
WILLINGNESS TO GIVE UP VARIOUS ITEMS
BY GENDER OF RESPONDENT

<u>Female More Willing Than Male[†]</u>		<u>Female Less Willing Than Male[†]</u>	
<u>1971</u>	<u>1981</u>	<u>1971</u>	<u>1981</u>
Beefsteak	Beefsteak	Coffee/Tea	Coffee/Tea
Country Club	Country Club	* Current Fashion	Current Fashion
Motorcycle	Motorcycle	Deodorants	* Deodorants
* Prewrapping Food	Prewrapping Food	Jewelry	Jewelry
TV	TV	Perfume/Aftershave	* Perfume/Aftershave
Canned Soft Drinks	Air Conditioner	Air Travel	City Transit
Watches	Formal Dress	Bicycle	Long Distance Buses
	* Garbage Disposal	Clothes Dryer	
	Hi-Fi	Home Oven	
	Milk		
	Supersonic Jet		

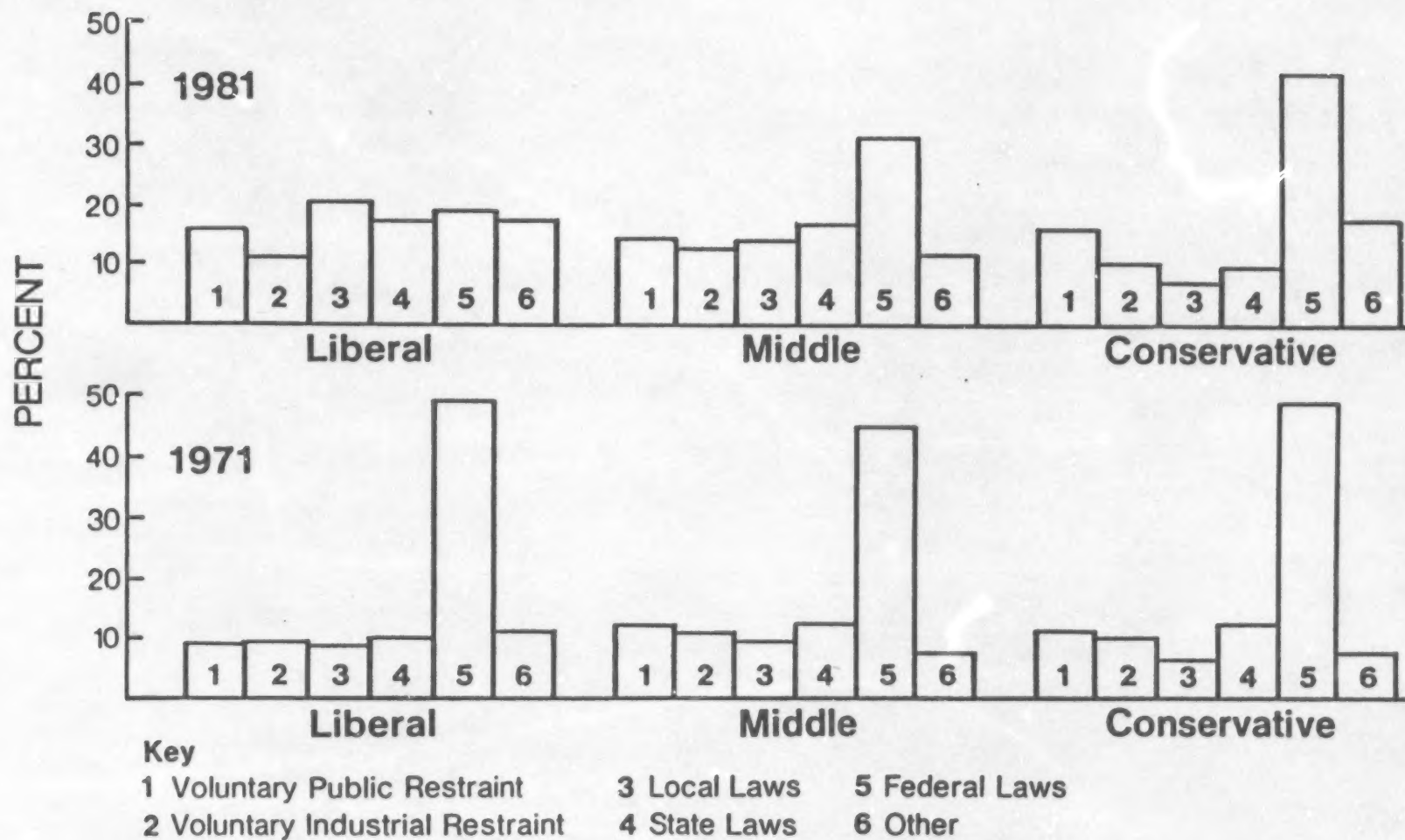
[†] It must be recognized that since this table is based on significant differences and not absolute values, these headings could also be listed as:

"Male Less Willing Than Female" and "Male More Willing Than Female"

* These items were significant at the .05 level. All other items were significant at the 0.01 level

Figure 9

**Preferred Methods for Limiting Energy and Material Consumption
Environmental Attitude Surveys 1971 vs 1981**



Other Northeast States and Other States) fewer items were found to be significantly different than for the rural-urban-suburban classification (8 of 35 items in 1981 and 11 of 35 in 1971 that showed regional differences). Although the regional effects were scattered among most of the categories there were minimal differences in the recreational category (country club in 1971 being the only item exhibiting a significant effect of regionality). Respondents from New York state did, however, appear to have attitudes that were in-between the values chosen by the other two areas.

Control Measures

Respondents to both surveys favored Federal Laws as the way to limit energy and material consumption. When the data were examined according to political leanings (liberal, middle of the road, conservative) there was a decided difference between the two surveys (Figure 9). This was especially noted in the liberal group which favored Federal Laws by 48.9% in 1971 but only by 18.5% in 1981. The middle and conservative groups continued to favor Federal Laws in 1981 as the main choice, although by slightly lower percentages (from 44.8% to 31.6% and 49.4% to 41.0%, respectively, for the middle and conservative groups in 1971 and 1981). The liberal contingent shifted their choices to a more balanced distribution among the six choices available.

DISCUSSION

The results of the two surveys indicated that significant changes in attitudinal responses to environmental, material and energy resources occurred among Cornell students during the ten year span from 1971 to 1981.

The changes were correlated with the political leanings, income, gender and geographic background of the respondents. These differences tended to be oriented in a pattern of preferences that favored materialistic considerations and more conservative approaches to the environmental-resource issues. The use of numerical values in the design of the questionnaire contributed markedly toward a positive identification of attitudes of the respondents. The resultant choice patterns were consistent among the many classifications tested and indicated that the changes observed were due to differences in outlook and attitudes over this time span.

The pattern of these changes followed the trends observed in a summary report of environmental issues during this period (10). This study indicated a softening of attitudes toward environmental issues and the emergence of economic or materialistic issues as primary motivating factors during the late 1970's and early 1980's. Other factors that may have had some bearing on these changes were reported in studies that show less emphasis on leadership and professional advancement in deference to meeting individual and family needs and preferences (11,12).

Surveys of electric utilities by the Electric Power Research Institute in 1981 and 1982, to determine the preferred areas for future research and development, indicated some upward shifts for conservation (fourth to second rank) and energy management (seventh to fourth rank) (13). In contrast, the priorities for energy analysis, environmental concerns and renewable resources appeared to be weaker in 1982 (moving from eighth, ninth and tenth ranks in 1981 to tenth, ninth and twelfth, respectively, in 1982).

A consideration of the differences in attitudinal responses for our two surveys as possibly influenced by the seemingly more important variables, follows:

Political Leanings

The shift to conservatism, as proclaimed in the 1980 elections and as objectively measured by various polls (Gallup, Harris, Roper) also occurred within the university student body - a traditional rampart of liberalism. This move to conservatism had a strong bearing on the attitudes as apparent from the shift in willingness to give up items.

When the political leanings were grouped into the three classifications, the data gave consistent stepwise response patterns for both surveys. Twenty-nine of 35 items showed changes in either increasing or decreasing willingness to give up items depending on whether the respondents were liberal or conservative, respectively.

These data indicate that political leanings were statistically correlated with 80 percent of the items in 1981 and 94 percent in 1971. The changes were generally toward less willingness to part with items (1981 results showed 17 less willing, 7 more willing and 11 approximately equal to 1971 data). The liberal group was generally most willing to give up items. However, this group was not indiscriminate, for they chose more strongly than the conservatives to retain coffee/tea, hi-fi, bicycle, city transit, rail travel, long distance buses, hiking, movies, and live musical entertainment. Incorporated within these choices was an apparent awareness of wider public needs as shown by the desire to retain transportation systems and economical recreation. At the same time there was a realization that the auto was and remains an integral part of an individual's life style regardless of political differences. The absolute differences were strongest in the personal item category with the liberal group considering these items to be more expendable.

Income

Attitudinal patterns were associated with family income levels within as well as between each of the two survey periods. There were 16 items within each survey that indicated a significant correlation of income with attitudinal patterns (ten of the items were common to both surveys). The transportation and household groupings were most influenced by family income levels with the recreational, personal and food-stuffs categories following, respectively. In general, the trend was toward an unwillingness to give up items as family income levels increased. In 1981 the respondents with high family income had lowest mean values (less willing to give up) for 25 of the 35 items. A similar pattern existed for the 1971 high income respondents who ranked 23 of 35 items lower than the middle and low income respondents. Thus, it appeared quite clear that students from the higher income families were much more reluctant to give up items for energy or resource oriented reasons.

Gender

It is not surprising that the surveys reflected woman's liberation and feminist movements. The 10.7% increase of women among total respondents in 1981 clearly resulted from Cornell's adjustment to these concerns. One might expect that increasing the percentage of female respondents would have a polarizing effect on the over-all response. This was not the case, at least not when compared to the strong weighting effects of political leanings and income. There was not a general tendency for either males or females to be more sacrificing in their attitudes.

In the area of food-stuffs, where women have traditionally played greater roles, they were found to be more willing in both surveys than men to

give up prewrapped foods and beefsteak. The only item in this group for which they expressed less willingness to sacrifice was coffee and tea. A lack of strong polarization on household items may be interpreted as being indicative of non-traditional attitudes among Cornell undergraduates. In 1971 Cornell women were less willing than men to give up clothes dryers and ovens but in 1981 their responses were similar to men. Their 1981 responses also revealed a greater willingness to relinquish home air conditioners, hi fi's and garbage disposals.

Response patterns were consistent with the view that more women were moving toward the market place in 1981. Household items and formal dress became comparatively less important to them, while the timepiece (watch) that structures the day, was shifted from a position of relative unimportance to a position of equal importance for both sexes. However, sex difference was maintained and was strongest for personal items where women consistently rated perfume, deodorants, jewelry and current fashion as more essential than did men. This area may be the one in which they express their individuality or uniqueness as women. Conversely, the responses are consistent with men maintaining a traditional masculine image (less willing than women to give up beefsteak, country club, motorcycle and television).

Other Factors

In contrast to the factors discussed earlier, it was disappointing to find that education did not play a major role in attitudinal responses on energy/resource issues for either survey. Since university students will presumably be the leaders of tomorrow, effective education on environmental issues should be an important consideration. There was indication of a trend from the two upper academic classes for which responses showed a greater

willingness to give up items than for the two lower classes. This might be attributed to the general accumulation of knowledge and the implications of these issues. However, enrollment in the Biology and Society course and the responses from the enrollees indicated that only 9 items were significantly correlated in 1971 and 12 items in 1981. These results might be indicative that the general level of awareness was already quite high and was maintained at that level for both attendees and non-attendees of this course. The importance of this area of concern to faculty and students was demonstrated by the formalization of a major field of study in 1976 entitled "Biology and Society".

In contrast to the small differences found among academic classes there were wide differences among students from the different schools or colleges within the university (67 percent of the items in 1981 and 80 percent of them in 1971 showed significant differences by college or school of enrollment). These differences were observed in all five categories with most occurring in the recreational category followed closely by transportation, personal, food-stuffs, and household items. Despite the wide diversity of attitudes there was a uniform acceptance of the telephone, home oven, home freezer, and soap as very important items.

When the locational influence of students' backgrounds was considered there were more differences attributed to the rural-urban-suburban origins than to the in-state versus out-of-state origins. The major difference between these two analyses arose in the recreational category which showed that the state of origin was less influential on attitudes than the degree of urbanization. Recreational items responsible for this difference were hiking, movies, and skiing from both surveys and the motorcycle in the 1971 survey.

In terms of control measures it is possible that the sensitivities aised by the environmental issues of the late 1960's and early 1970's may have swept liberals into a national action response where federal laws were the preferred route. However, by 1981 the strength of the environmental movement had weakened and a re-sorting of views was underway as dissatisfaction with the federal establishment became more prevalent.

Some further insights may be provided by examining the items in each category which were ranked highest for both surveys. For example, in the food-stuffs category, milk was checked as the least willing give-up item by more than 60 per cent of the respondents in each survey. Perhaps, this is an indication of the nutritional importance that is associated with milk. The willingness to give up canned soft drinks (over 50 per cent) may be indicative of the movement toward deposit laws by many states. In the household category, the home oven and telephone were considered as the most important items (over 60 per cent least willing to give up each item); they probably relate to basic concerns for food and communication. The willingness to give up the home garbage disposal and home air conditioner (more than 70 per cent and 40 per cent, respectively) may simply reflect the number of such units in the survey area. In the transportation category the reaction to supersonic jet travel (over 70 percent most willing to give up) has been confirmed by the limited success of that mode of travel. However, the automobile was easily recognized as an important item by the respondents (over 40 per cent least willing to give up) since our society places high value on mobility and independence. In personal items, the high ranking for soap (least willing give up for nearly 80 per cent of the respondents) is undoubtedly related to the cleanliness and health concepts that are an integral part of our history and life styles. The willingness to part with

other personal items (perfume/after shave, current fashion, jewelry and formal dress) may indicate the strengths of some value concepts that might operate under stress or pressure circumstances. This pattern was also observed in the recreational category where the country club and motorcycle were the preferred give up items (over 60 per cent for each) while hiking was the choice as the item to be retained (over 50 per cent least willing to give up).

SUMMARY

Significant differences were observed in the attitudinal responses of Cornell students toward material and energy resource questions for surveys taken in 1971 and 1981. Student respondents were most reluctant to give up items in the household category. Then items in the transportation, food-stuffs, personal and recreational categories followed in relative order of importance. The differences in response were primarily associated with political leanings, income, gender and geographic background, with education only a minor influence. The changes over the time span showed a reduced willingness to give up many items despite the perceived limitations of our material and energy resources. Thus, the trend seemed to be toward a more materialistic life/style which evoked less consideration for environmentally oriented issues and concerns.

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APPENDIX A

1981 ENVIRONMENTAL ATTITUDE SURVEY
DIVISION OF BIOLOGICAL SCIENCES, CORNELL UNIVERSITY

This questionnaire was devised to sample attitudes and provoke thought on the postulated future environmental crisis. Please return it by May 9th so it can be collated before the end of the semester. Your participation is voluntary. We hope you will respond.

1. "In the U.S. our material and energy resources are seriously limited when considered in terms of population growth, increasing per capita consumption and increased environmental pollution."

How do you react to the above statement? Strongly disagree 1 2 3 4 5 Strongly agree

2. After scanning the items in Group A, rate on a 1-5 scale your willingness to give up those which concern you. That is, for each item decide how willing you are to give it up and circle the appropriate number. Then do B, C, D, and E. Please do not circle more than one number for each item.

Group A		Least Willing			Most Willing	
Food Stuff						
1.	Frozen foods	1	2	3	4	5
2.	Canned soft drinks	1	2	3	4	5
3.	Prewrapping of fresh meat, fruit and vegetables	1	2	3	4	5
4.	Beef steak	1	2	3	4	5
5.	Coffee and tea	1	2	3	4	5
6.	Instant foods (mixes and dehydrated)	1	2	3	4	5
7.	Milk	1	2	3	4	5

Group B		Least Willing			Most Willing	
Household Items						
1.	Clothes drier	1	2	3	4	5
2.	Home air conditioning	1	2	3	4	5
3.	Telephone	1	2	3	4	5
4.	Hi-fi	1	2	3	4	5
5.	Oven in home	1	2	3	4	5
6.	Home freezer	1	2	3	4	5
7.	Home garbage disposal	1	2	3	4	5

Group C		Least Willing			Most Willing	
Transportation						
1.	Bicycle	1	2	3	4	5
2.	City transit systems	1	2	3	4	5
3.	Air travel (conventional)	1	2	3	4	5
4.	Railroad travel (passenger)	1	2	3	4	5
5.	Supersonic jet travel	1	2	3	4	5
6.	Automobile	1	2	3	4	5
7.	Long distance buses	1	2	3	4	5

Group D		Least Willing			Most Willing	
Personal Items						
1.	Formal dress	1	2	3	4	5
2.	Perfume and aftershave	1	2	3	4	5
3.	Deodorants	1	2	3	4	5
4.	Jewelry	1	2	3	4	5
5.	Current fashion	1	2	3	4	5
6.	Soap	1	2	3	4	5
7.	Watches	1	2	3	4	5

**Group E
Recreation**

	Least Willing			Most Willing		
1. Hiking	1	2	3	4	5	
2. T.V.	1	2	3	4	5	
3. Movies	1	2	3	4	5	
4. Skiing	1	2	3	4	5	
5. Motorcycle	1	2	3	4	5	
6. Live musical performances	1	2	3	4	5	
7. Country club	1	2	3	4	5	

3. How would you respond to the following measures?

	Least Willing			Most Willing		
1. Ration the use of electricity (quotas, etc.)	1	2	3	4	5	
2. Require car pools to and from work	1	2	3	4	5	
3. Increase taxes to pay for mass transport systems	1	2	3	4	5	
4. Increase the cost of consumer goods to pay for pollution control	1	2	3	4	5	
5. Increase electric rates so consumers will use less	1	2	3	4	5	
6. Pay \$500 per car to install pollution devices	1	2	3	4	5	

4. If it becomes necessary to limit our energy and material consumption, what means do you think would best accomplish this? (1) Voluntary public restraint____
(2) Voluntary industrial restraint____ (3) Local laws____ (4) State laws____
(5) Federal laws____ (6) Other_____

5. Have you taken a course on problems of population and environment such as Biology and Society 301 or 302? (1) Yes____ (2) No____

6. Current Status:

(1) _____ (2) _____ (3) _____ (4) _____ (5) _____ (6) _____ (7) _____
Fresh. Soph. Jr. Sr. Grad. Faculty Other

7. School: (1) Ag & LS____ (2) Arch & FA____ (3) Arts & Sci____ (4) Engr____
(5) Hotel Ad____ (6) Human Ec____ (7) ILR____ (8) Other____

8. Sex: (1) M____ (2) F____ (3) Single____ (4) Married____ (5) Previously Married____

9. No. in family____ Age____ Background: (5) _____ (6) _____ (7) _____
Rural Urban Suburban

10. Home State _____

11. A. Family Income: (1) \$ 1 - 5,000____ (5) \$24 - 35,000____
(Range) (2) 5 - 9,000____ (6) 35 - 50,000____
(3) 9 - 16,000____ (7) 50 - 65,000____
(4) 16 - 24,000____ (8) 65 - over _____

B. Do you want the purchasing power of your family to be:

(1) _____ (2) _____ (3) _____ your parents' family? (4) _____
greater less equal
than than to
no opinion

12. Your own political leanings: 1 2 3 4 5 6 7
very radical very conservative
(far left) (far right)